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EXAMINER	
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ART UNIT	PAPER NUMBER
3664	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/820,037	KOH ET AL.	
	Examiner	Art Unit	
	JORGE O. PECHE	3664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2007 and 21 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5,7 and 10-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *1,3,5,7 and 10-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Receipt is acknowledged of applicant's argument/remarks filed on November 14, 2007, **claims 1, 3, 5, 7,** and **10-13** are pending and an action on the merits is as follows.

Applicant's arguments with respect to **claims 1, 3, 5, 7,** and **10-13** have been fully considered but are moot in view of the new ground(s) of rejection. Applicant had cancelled **claims 2, 4, 6 8-9,** and **14-15.**

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims **1, 3, 5, 7-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Paromtchik** et **al. (Pub No.: US 2002/0027652 A1)** in view of **Bartsch et al. (Patent No.: US 6,459,955 B1).**

Regarding **claims 1, 5,** and **7,** Paromtchik discloses an instructing target positioning system for mobile body comprising:

- Light beam (light commander) projected on the surface to command a mobile robot to a new location (see page 2, par. 25; page 4, par. 55-58, Figure 1).

- A sensor unit (12a) (optical device) to receive and detect light beacon position having specified features (see page 2, par. 29; page 4, par. 68; Figure 3).
- A controller unit (12d) (imagine processor) to process sensor (12a) data, calculate the relative coordinate of positions where the light beacons reside, and generate command signals to a server unit (12b) to move the robot to a relative position (see page 2, par. 33; page 5, par 69-71; Figure 3).

However, Paromtchik fails to disclose a memory to store the command, and a command pattern formed by the reflecting which corresponds to the command, wherein the controller determines whether the reflecting trace based on the reflecting position is in accordance with the command pattern corresponding to the command stored in the memory, and outputs the command to the driving part when the reflecting trace is in accordance with the command pattern.

However, Bartsh teaches a cleaning robot apparatus comprising a data structure (program or command) stored in a memory. This data is not limited to a stored schedule of function such as the number of encoder pulse per unit time from each of the locomotion motor, the compass direction per unit time, or relative position coordinates. For instance, triangulated position from sonar, light, or other beacon means, and other stored or calculated data against which real time sensor inputs can be compared to guide a mobile (see col. 6, 34-60).

Furthermore, Paromtchik discloses a light beam having a predetermined features that are projected on the surface on which mobile bodies are to be transferred in an environment and a control unit (12d) to process sensor (12a) data and generate

command signals to a server unit (12b) to move the robot to a relative position (see page 5, par 69-71; Figure 3).

A person of ordinary skill in the art, upon reading Paromtchik's reference would have recognized the desirability of an improved control unit function for a mobile body system. Bartsh's reference teaches a memory unit to store data structure for a guiding robot by comparing sonar, light or other beacon signals with stored command. Thus, it would have been obvious to a person of ordinary skill in the art to implement the memory unit and its process (Bartsch's invention) in an attempt to provide an improved robotic control system. Under this process, it would have been obvious to one of ordinary skill in the art to understand that the robotic control unit would drive the robot in accordance to its stored data structure by comparing the received light signal with the stored command.

Doing so would enhance a mobile robot navigation system capable to reduce navigation error due to external light source and optimize the robot performance.

Furthermore, Paromtchik discloses a sensor unit (12a) (optical device) to detect light beacons having specified features (see page 2, par. 29; page 4, par. 68; Figure 3). Paromtchik also discloses a light beam having a predetermined features that are projected on the surface on which mobile bodies are to be transferred, and a control unit (12d) to process optical signal, sensor unit (12a) output (optical device), received from light beams and generate command signals to a server unit (12b) for moving the robot to a relative position, which can be enclosed in a given area (see page 5, par 69-71; Figure 3).

However, Paromtchik fails to disclose a mobile robot comprises a cleaner to clean an area immediately after the optical device receives the teaching position without performing a compensating process.

However, Bartsch teaches a home cleaning robot comprising a cleaner to clean a home area (see abstract; column 2, line 58- column 3, line 18).

As Paromtchik discloses an instructing target positioning system comprising a sensor unit (12a) (optical device) to receive and detect light beacon position having specified features, a controller unit (12d) (imagine processor) to process sensor (12a) data, calculate the relative coordinate of positions where the light beacons reside, and generate command signals to a server unit (12b) to move the robot to a relative position and a server unit (12b) to execute a control command produced by the control unit (12b) (*clean the area immediately without performing a compensating process*); a person of ordinary skill in the art, upon reading the reference, would also have recognized the desirability of improved method for instructing not only a target position for mobile bodies to be transferred by using optical guidance system, but also for monitoring a home cleaning robots provided with a means (e.g. optical configuration such as camera or radar system) to perform useful function and capable of learning and adaptively performing useful functions. Bartsch teaches a home cleaning robot comprising a computer processing unit for storing, receiving and transmitting data, and a cleaning implement operatively associated with the robot. The robot receives input data from an external source. The external source may be physical manipulation of the robot, remote

control, or by triangulation from at least three external transmitters including reflective or active optical beacons (see abstract and col. 4, lines 27-38). Thus, it would have been obvious to a person of ordinary skill in the art to try the method for autonomously move a cleaning robot for monitoring a home cleaning robots to perform useful functions in an attempt to provide an improved instructing target positioning system, as a person with ordinary skill has good reason to pursue the known option with his or her technical grasp.

Given the teaching of Bartsch, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Paromtchik's invention to incorporate a vacuum cleaner in a mobile robot.

Doing so would enhance a home cleaning robot capable of learning and adaptively performing useful functions.

Regarding **claim 3**, Paromtchik discloses a laser unit (16a) to project a laser pointer on a surface (three dimensional space) (se page 4, par 54-58; Figures 3).

4. Claims **10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Paromtchik** et **al. (Pub No.: US 2002/0027652 A1)** in view of **Bartsch et al. (Patent No.: US 6,459,955 B1).**

Regarding **claim 10**, Paromtchik discloses a method for instructing target position for mobile bodies comprising the set of:

- Providing a light beam (light commander) projected on a surface to command a mobile robot to a new location (see page 2, par. 25; page 4, par. 55-58, Figure 1).
- Having a memory, inherently located in the control unit (12a), for storing a program to correlate light beam and command signals to drive the robot to a relative position (see page 4, par. 57-58, 68; page 5, par 69-71; Figure 3).
- Detecting the position of light beam in a predetermined time interval (see page 2, par. 29; page 4, par. 68; Figure 3).
- A light beam having a predetermined features such as color, shapes, brightness, and manners of lighting on (plurality of command features) and a control unit (12d) capable to store in a memory a program to correlate light beam and command signals to drive the robot to a relative position (see page 2, par. 33-34; page 5, par 69-71; Figure 3)

However, Paromtchik fails to teach a method of controlling a robot system comprising the steps of determining whether the reflecting trace is in accordance with the command pattern; and controlling the mobile robot to operate according to the command corresponding to the command pattern when the reflecting trace is in accordance with the command pattern.

However, Bartsch teaches a home cleaning robot comprising a data structure, (program or command) stored in a memory. This data is not limited to a stored schedule of function such as the number of encoder pulse per unit time from each of the locomotion motor, the compass direction per unit time, or relative position coordinates.

For instance, triangulated position from sonar, light, or other beacon means, and other stored or calculated data against which real time sensor inputs can be compared to guide a mobile (see col. 6, 34-60).

Furthermore, Paromtchik discloses a light beam having a predetermined features that are projected on the surface on which mobile bodies are to be transferred in an environment and a control unit (12d) to process sensor (12a) data and generate command signals to a server unit (12b) to move the robot to a relative position (see page 5, par 69-71; Figure 3). Furthermore, Paromtchik discloses a method for determining the feature of the light beacon such as color, shapes, brightness, and manners of lighting (see page 2, par. 33-34) and for controlling the motion of a robot by processing optical signal (sensor unit (12a)) received from the reflected light beam and calculating the relative coordinate of positions where the light beacons reside (see page 2, par. 33; page 5, par 69-71; Figure 3).

A person of ordinary skill in the art, upon reading Paromtchik's reference would have recognized the desirability of an improved control unit function for a mobile body system. Bartsch's reference teaches a memory unit to store data structure for a guiding robot by comparing sonar, light or other beacon signals with stored command. Thus, it would have been obvious to a person of ordinary skill in the art to implement the memory unit and its process (Bartsch's invention) in an attempt to provide an improved robotic control system. Under this process, it would have been obvious to one of ordinary skill in the art to understand that the robotic control unit would drive the robot in

accordance to its stored data structure by comparing the received light signal with the stored command.

Doing so would enhance a mobile robot navigation system capable to reduce navigation error due to external light source and optimize the robot performance.

Regarding **claims 11-13**, Paromtchik fails to disclose a method wherein when the reflecting trace is not in accordance with the command pattern and draws a line segment, the mobile robot is controlled to move along the line segment, wherein when the reflecting trace is not in accordance with the command pattern and draws a closed loop, the mobile robot is controlled to enter an area formed by the closed loop, and wherein when the reflecting trace is not in accordance with the command pattern and points to a point, the mobile robot is controlled to move to the point

However, as Paromtchik discloses a light beam having a predetermined features such as color, shapes, brightness, and manners of lighting on (plurality of command features) and a control unit (12d) capable to store in a memory a program to correlate light beam and command signals to drive the robot to a relative position (see page 2, par. 33-34; page 5, par 69-71; Figure 3), it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement light beams to draw close loop and point to point features to command the robot to enter the close loop area or approach the point feature. Furthermore, as the robot implement optical devices such infrared sensor, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to adjust the computer program to ignore/eliminate external

reflected trace such as sun and lamp lights to allow the robot to complete its trajectory (moving along a line segment).

Doing so would enhance a mobile robot navigation system capable to reduce navigation error due to external light source and optimize the robot performance.

Response to Argument

In the Applicant's arguments/remarks filed on November 14, 2007, with respect to **claims 1, 3, 5, 7-9 and 10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Paromtchik** et **al. (Pub No.: US 2002/0027652 A1)** in view of **Bartsch et al. (Patent No.: US 6,459,955 B1)** have been fully considered but are not persuasive.

Regarding Applicant first argument (page 5, par. 3, and page 7, par. 2), "Paromtchik is relied on to show the control features of the robot, however, and it is respectfully submitted that Paromtchik does not discuss the technical feature of claim 1 where the controller controls the mobile robot to enter a specified area and to clean the area immediately after the optical device receives the teaching position without performing a compensating process." Applicant is kindly invited to consider the new ground of reject where Applicant's amended claims and remarks are addressed.

Regarding Applicant second argument (page 6, par. 1) "The Office Action does not specify any particular portion of Paromtchik or Bartsch to show this feature of claim and instead notes that this feature, along with the technical features recited in claims 11- 13, are obvious because they would enhance the robot's navigation system and

reduce errors." The Examiner respectfully disagrees. The Examiner had considered all claim limitation in his rejection by articulating finding as to the scope and content of the prior art as need to support the obviousness rejection being made. Applicant is kindly invited to consider the reference as a whole, and for this argument, concentrate on Paromtchik's page 2, par. 33-34; page 5, par 69-71; Figure 3. Furthermore, Applicant is kindly invited to view the above rejection in respond to this argument for more detail explanation.

Regarding Applicant third argument (page 6, par. 2), "It is respectfully requested that references be provided to show the technical feature of claim 10 where a plurality of reflecting traces corresponding to a plurality of command patterns are combined and stored as a single command pattern in the memory." Applicant is kindly invited to consider the reference as a whole, and for this argument, concentrate on Paromtchik's page 2, par. 33-34; page 5, par 69-71; Figure 3. Furthermore, Applicant is kindly invited to view the above rejection in respond to this argument for more detail explanation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jorge O. Peche whose telephone number is (571)270-1339. The examiner can normally be reached on 8:30 am - 5:30 pm Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi H. Tran can be reached on 571-272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jorge O Peche/
Examiner, Art Unit 3664

February 4, 2008

/Khoi H Tran/
Supervisory Patent Examiner, Art Unit 3664